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Esthetic Alveolar Ridge Preservation Without Primary Closure

by Barry K. Bartee, DDS, MD and H. Dexter Barber, DDS

For nearly a century, bone loss following tooth extraction has been recognized as a significant clinical problem.^{1,2} Over the years, numerous techniques have been devised to preserve alveolar bone after tooth extraction³⁻⁷ and there is now ample scientific evidence to support the routine use of extraction site grafting.⁸⁻¹¹ A majority of these techniques involve the use of guided tissue regeneration barriers in some form, with a requirement for primary closure.

It is interesting that in spite of the apparent benefits of socket grafting, the procedure is not widely used in general dental practice. The authors believe that one major reason for this is the requirement for primary closure. As an alternative approach, this article will describe a predictable technique for socket grafting that does not require primary closure, involves a minimally invasive, streamlined surgical approach, and can be accomplished at a very reasonable cost.

In the context of socket grafting, the avoidance of primary closure has several advantages. First, the procedure is greatly simplified from a surgical standpoint. There is minimal trauma to the soft tissue because flap reflection is limited to the creation of a shallow subperiosteal pocket to stabilize the membrane. Thick, keratinized mucosa is preserved in its anatomical position, and because the socket ultimately heals by secondary intent, additional keratinized tissue is generated. Finally, because the membrane is exposed to the oral cavity intentionally, a non-resorbable material can be employed as a barrier.



Technique

In this technique, the authors prefer high-density polytetrafluoroethylene barrier (Cytoplast GBR-200, Osteogenics Biomedical Inc., Lubbock, TX), which is a proven material for guided tissue regeneration. Among the advantages of this material are the ease of use, and, because of the nominal pore size of less than 0.02 μm , it is impervious to bacteria.¹¹⁻¹⁴ The last feature is important in this technique because the barrier must not only protect the underlying socket and graft material from epithelial ingress, but from bacterial contamination as well.

Stabilization

Stabilization of the barrier is achieved by cellular adhesion rather than tissue ingrowth. To stabilize the barrier, it is simply tucked into a subperiosteal pocket on the buccal and lingual aspect of the extraction socket. The subperiosteal pocket need not be any deeper than 3.0 to 5.0 mm unless there

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Esthetic Alveolar Ridge Preservation Without Primary Closure

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is a larger defect in the socket wall that must be covered by the barrier. In the interdental region, the membrane is secured by simply approximating the interdental papilla in the usual fashion.

In this technique a variety of grafting materials may be used, including autogenous bone, allogenic bone, xenogenic bone, or any of the synthetic materials available. Furthermore, the technique is excellent when used in conjunction with immediate placement of dental implants, reliably preventing epithelial downgrowth around the implant and promoting the development of a bony interface at the coronal aspect of the implant.¹⁵

Barrier Removal

Since a non-resorbable barrier membrane is used, it must be removed. However, removal of the barrier is a simple, non-surgical process similar to suture removal. If desired, topical anesthetic may be applied. To remove the barrier, it is simply grasped with a tissue forcep and gently removed from the subperiosteal pocket. Based on studies of extraction site wound healing, the barrier should remain in place for 21 to 28 days to ensure exclusion of epithelium from the socket and consolidation of the underlying augmentation materials and osteoid.^{16,17}

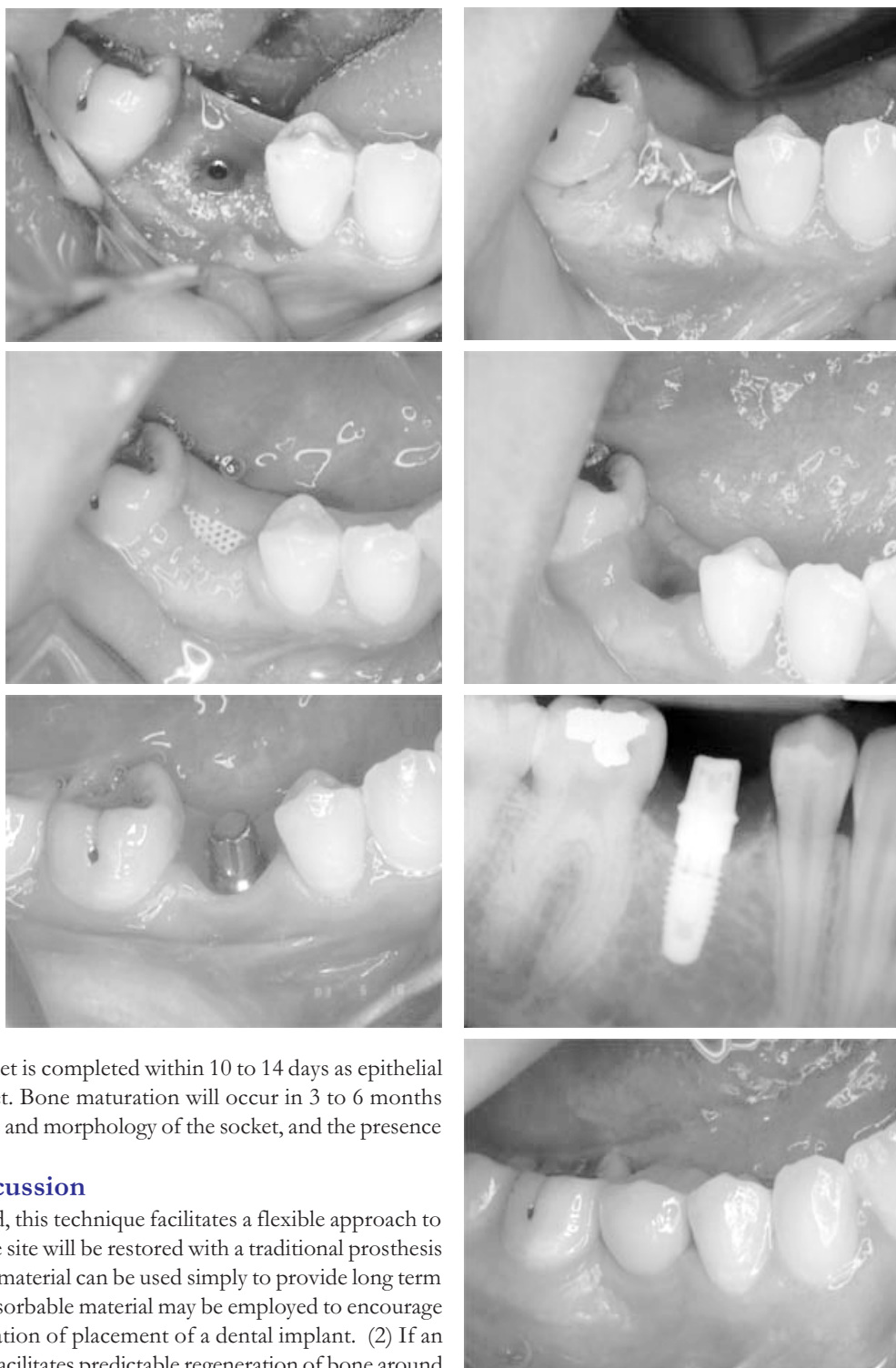
At that time, the entire socket can be observed filled with well-consolidated, bone-derived tissue. Following barrier removal, epithelialization of the socket is completed within 10 to 14 days as epithelial cells migrate from the margins of the socket. Bone maturation will occur in 3 to 6 months depending on the graft material used, the size and morphology of the socket, and the presence of any adjoining defects.

Discussion

Depending on the outcome desired, this technique facilitates a flexible approach to the management of extraction sites: (1) If the site will be restored with a traditional prosthesis (fixed or removable), a non-resorbable graft material can be used simply to provide long term ridge preservation. Alternatively, a rapidly resorbable material may be employed to encourage complete regeneration of the site in anticipation of placement of a dental implant. (2) If an immediate implant is desired, this technique facilitates predictable regeneration of bone around the fixture in a traditional two-stage approach, eliminating the potential for epithelial downgrowth around the fixture. (3) For larger defects where delayed implant placement is desired, the technique is a predictable method of regenerating bone *and* keratinized mucosa, greatly simplifying esthetic implant placement and restoration.

The avoidance of the requirement for primary closure is a unique feature of this technique. Historically, porous membranes such as e-PTFE and resorbable membranes such as bovine collagen have required primary closure for predictable results. In contrast, graft failure due to bacterial invasion of the membrane and/or premature degradation, simply cannot happen with high-density PTFE.

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Advantages

Clinical advantages of the open technique include; (1) simplified surgical technique requiring minimal flap reflection, (2) simple, non-surgical removal of the barrier with no risk of premature degradation or complications from exposure and (3) preservation and regeneration of a thick keratinized tissue at the implant site.

Clinical Case Presentation

This is a 20 year-old female with a retained, carious lower right primary first molar. Extraction of the tooth with immediate implant placement was planned (Figure 1). Defects associated with retained primary molars are typically wide and shallow. Primary closure of this type of defect would be challenging, and would certainly result in a loss of keratinized tissue width (Figure 2). A screw type implant is placed into ideal restorative position. The defect between the implant and socket wall is augmented with anorganic bovine bone. The defect was approximately 2.0 mm in depth and 2.0 mm in width (Figure 3).

A textured, high-density PTFE barrier membrane (Cytoplast® TXT-200) is placed over the implant and graft material, extending 3.0 mm beyond the buccal and lingual socket margins. The flaps are loosely approximated with Cytoplast® PTFE suture with no attempt to achieve primary closure (Figure 4). In this clinical photo, the sutures have been removed and the exposed barrier is clearly visible (Figure 5). Note the healthy condition of the soft tissues adjacent to the barrier.

The barrier is removed in this case at 21 days (Figure 6) with tissue forceps. Only topical anesthesia is required. In this clinical image taken immediately following barrier removal, a highly vascular, bone-derived osteoid tissue is seen covering the implant and graft complex. A small amount of bleeding is normal upon removal of the barrier. In approximately 10 to 14 days, epithelium from the flap margins will migrate across the osteoid surface, thus completing the wound healing process.

A primary advantage of this technique is the preservation of natural socket architecture. In this photo (Figure 7), taken after a period of provisional loading of the implant, one can appreciate the natural appearance of the soft tissue contours. Radiographically, the bone appears to be responding favorably to load (Figure 8). The final restoration appears as a natural tooth, indicated by the presence of healthy keratinized tissue and the natural appearance of the mucogingival junction and interdental tissue (Figure 9).

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References

- Campbell RL. A comparative study of the resorption of the alveolar ridges in denture wears and non denture wearers. *J Amer Dent Assn.* 1960;60:143-153.
- Tallgren A. The continuing reduction of the residual alveolar ridges in complete denture wearers: A mixed-longitudinal study covering 25 years. *J Prosthet Dent.* 1972; 27:120-132.
- Garver DG, Fenster RK. Vital root retention in humans: a final report. *J Prosthet Dent.* 1980;43:368-373.
- Von Wowern N, Winther S. Submergence of roots for alveolar ridge preservation. A failure (4-year follow-up study). *Int J Oral Surg.* 1981;10:247-250.
- Quinn JH, Kent JN. Alveolar ridge maintenance with solid nonporous hydroxylapatite root implants. *Oral Surg Oral Med Oral Pathol.* 1984;58:511-521.
- Stanley HR, Hall MB, Clark AE, King CJ 3rd, et al. Using 45S5 bioglass cones as endosseous ridge maintenance implants to prevent alveolar ridge resorption: a 5-year evaluation. *Int J Oral Maxillofac Implants.* 1997;12:95-105.
- Bartee BK. The use of high density polytetrafluoroethylene membrane to treat osseous defects: Clinical reports. *Implant Dent.* 1995;4:21-26.
- Nemcovsky CE, Serfaty V. Alveolar ridge preservation following extraction of maxillary anterior teeth. Report on 23 consecutive cases. *J Periodontol.* 1996;67:390-395.
- Lekovic V, Kenney EB, Weinlaender M, Han T, et al. A bone regenerative approach to alveolar ridge maintenance following tooth extraction. Report of 10 cases. *J Periodontol.* 1997;68:563-570.
- Lekovic V, Camargo PM, Klokkevold PR, et al. Preservation of alveolar bone in extraction sockets using bioresorbable membranes. *J Periodontol.* 1998;69:1044-1049.
- Iasella JM, Greenwell H, Miller RL, Hill M, Drisko C, Bohra AA, Scheetz JP. Ridge preservation with freeze-dried bone allograft and a collagen membrane compared to extraction alone for implant site development: a clinical and histologic study in humans. *J Periodontol.* 2003 Jul;74(7):990-9.
- Bartee BK. Evaluation of a new polytetrafluoroethylene guided tissue regeneration membrane in healing extraction sites. *Comp Cont Ed Dent.* 1998;19:1256-1264.
- Bartee BK, Carr JA. Evaluation of a high-density polytetrafluoroethylene (n-PTFE) membrane as a barrier material to facilitate guided bone regeneration in the rat mandible. *J Oral Implantol.* 1995;21:88-95.
- Crump TB, Rivera-Hidalgo F, Harrison JW, Williams FE, Guo IY. Influence of three membrane types on healing of bone defects. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 1996;82:365-37.
- Walters SP, Greenwell H, Hill M, Drisko C, Pickman K, Scheetz JP. Comparison of porous and non-porous teflon membranes plus a xenograft in the treatment of vertical osseous defects: a clinical reentry study. *J Periodontol.* 2003 Aug;74(8):1161-8.
- Amler MH. The sequence of tissue regeneration in human extraction wounds. *Oral Surg Oral Med Oral Path.* 1969;27:309-318.
- Ohta Y. Comparative changes in microvasculature and bone during healing of implant and extraction sites. *J Oral Implantol.* 1993;19(3):184-98.